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To conclude, in the chapter on the Relation of the Crustacea to Man we miss any adequate account of the valuable lobster fisheries of the old and new worlds, or of the laborious experiments which have been made to rear the young of this much-prized crustacean, and which in America have finally led to success.

FRANCIS H. HERRICK

WESTERN RESERVE UNIVERSITY

*Qualitative Chemical Analysis.* A Laboratory Guide. By W. W. SCOTT, A.M., chief chemist, Baldwin Locomotive works, formerly Professor of Chemistry, Morningside College, New York. D. Van Nostrand Co. 1910. \$1.50 net.

*A Course in Qualitative Chemical Analysis.* By CHARLES BASKERVILLE, Ph.D., F.C.S., Professor in the Department of Chemistry of the College of the City of New York, and L. J. CURTMAN, Ph.D., Instructor in the Department of Chemistry of the College of the City of New York. The Macmillan Co. \$1.40 net.

We have in these two books further additions to our already long list of works on qualitative analysis.

The first contains a discussion of the ionic hypothesis, the mass law and other physical chemical principles with their applications to qualitative analysis, followed by a systematic study of the detection and separation of bases and acids, methods of analyzing an unknown substance and tables containing special data. The best methods of separation have been selected and a very valuable addition made in the form of notes on each group. In these notes the reasons for the various reactions used and the precautions recommended are discussed, thus enabling the student to work intelligently and not, as is so often the case, merely mechanically. This book can be recommended as an excellent laboratory guide to qualitative analysis, especially if the principles discussed in the theoretical part are applied to the reactions studied.

In the second work special emphasis is placed on the quantitative discrimination of the substances detected by qualitative meth-

ods of analysis as a preparation for quantitative analysis. In selecting methods of analysis those have been preferably chosen which they think can be most readily used by the student; especially if they give rise to precipitation tests which will enable the student to approximate the amounts present. As in the other work, explanatory notes have been introduced.

An objection the reviewer would make to this book is the almost complete absence of any applications of the present theories of solution and the mass law to the reactions of qualitative analysis. Although the statement is made in the preface that these matters are usually presented in lectures in general chemistry and may be taken up in lectures on qualitative analysis, they do not apply these in this book; but retain the molecular reactions and the theory of the formation of complex compounds in place of the methods which are now so generally taught.

J. E. G.

#### SPECIAL ARTICLES

##### CHANGES IN CHEMICAL ENERGY DURING THE DEVELOPMENT OF *FUNDULUS HETEROCLITUS*

ALTHOUGH at present it is hardly possible to do more than give a brief report of progress, nevertheless, the results which have been obtained from the calorimetric study of the beginning and end stages in the development of *Fundulus heteroclitus* harmonize so completely with the results gotten by Tangl and Farkas in the case of the chick and silkworm, respectively, that a brief account of the work appears warrantable at this time.

Omitting many details of technique, the methods employed in this study were as follows: The eggs of *Fundulus*, immediately after artificial fertilization, and the larvæ immediately after hatching, were dried at 40° C. This portion of the work was carried on at the Marine Biological Laboratory at Woods Hole, to whose director, Professor Frank R. Lillie, I am indebted for the use of a room. The material, which had been previously carefully counted, was then preserved in the dry state in ordinary phials until used for the chemical